IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
ALEXANDRIA DIVISION

PFIZER INC., *et al.*, Plaintiffs, v. TIGER PHARMACEUTICALS, LLC, Defendant.	Civil Action No. 1:14-cv-1501 (AJT/TRJ)

DECLARATION OF CRAIG ECKHARDT, PH.D.

TABLE OF CONTENTS

I, Craig Eckhardt, Ph.D., declare as follows:

I. INTRODUCTION AND SUMMARY OF OPINION

1. At the request of counsel for Defendant Tiger Pharmaceuticals, LLC ("Tiger"), I have been asked to: provide a technical background regarding crystals and polymorphs of dofetilide and analytical techniques used in the art to characterize polymorphs and opine on how a person of ordinary skill in the art would understand certain terms as recited in the claims of U.S. Patent No. 6,124,363 ("the '363 patent") (attached hereto as Ex. 1).

2. Briefly, for the reasons set forth below, it is my opinion that:

- DSC must be used to distinguish the polymorphs of dofetilide claimed in claims 1, 11 and 17;,
- the term "about" in claims 1, 11 and 17 encompass a range of ± 0.3° C;
- the term "substantially pure" in claims 1, 11, 17, 24, 25 and 26 of the '363 patent means "at least 95% by weight pure;" and
- the temperature describing the location of an "endothermic thermal event" would mean the temperature at which the endothermic thermal event has its maximum value.

3. In providing my opinions herein, I have considered a number of documents, which are listed in Ex. 2 (attached). Throughout this declaration, I cite portions of these and other documents. These citations are intended only as examples, however, and I reserve the right to rely on all portions of these documents in addition to those cited in this report. Additionally, I may use the cited materials to assist me in preparing demonstratives such as graphics and animations for my testimony.

4. This declaration is based on information known to me as of the date I signed this declaration. I reserve the right to amend or supplement this declaration in view of any additional

discovery, declarations, expert reports, briefs or testimony that is received from Plaintiffs ("Pfizer") after issuance of this declaration.

II. PROFESSIONAL AND EDUCATIONAL QUALIFICATIONS

5. I am a Professor in the Department of Chemistry at the University of Nebraska at Lincoln and have held that position since 1978. I was an Assistant Professor of Chemistry from 1967 to 1972 and then an Associate Professor from 1972 to 1978, all at the University of Nebraska at Lincoln.

6. I received my Bachelors of Art in Chemistry from the University of Colorado in 1962 and a Ph.D. in Chemistry from Yale University in 1967, specializing in solid state chemistry and molecular spectroscopy.

7. I have been a John Simon Guggenheim Memorial Fellow (Cambridge University) and a Fulbright Senior Fellow (Technical University of Wrocław). I have been a Visiting Professor at New York University, University of Milan (Statale), Pohang University, University of Stuttgart and Johannes Gutenberg University (Mainz).

8. The focus of my research recently has been in mechanochemistry, whereby mechanical forces affect and cause chemical reactions and how mechanical energy drives phase transitions.

9. I have over 116 publications, the large majority of which relate to the topic of crystalline structure of chemical compounds.

10. I have given about 85 invited lectures at universities throughout the world as well as at national and international conferences and have also presented approximately 84 papers at symposia, most of these address aspects of solid state chemistry.

11. A complete list of my professional and academic experiences, publications and presentations can be found in my curriculum vitae, which is attached as Ex. 3.

III. SCIENTIFIC AND TECHNICAL BACKGROUND

A. Crystals

12. A crystal is a homogeneous solid-state structure having molecules, atoms or ions arranged in a pattern that repeats periodically in three dimensions. This microscopic pattern manifests itself macroscopically in producing a solid that has a regular, usually highly symmetric three-dimensional shape that displays surfaces (faces) that, specific to the given form of the crystal, maintain a fixed angular relation between any given pair of faces. For example, carbon atoms may form as a crystal in the form of a diamond that has a periodic three-dimensional pattern at the microscopic level, which produces the highly symmetric three-dimensional gemstone we can see.

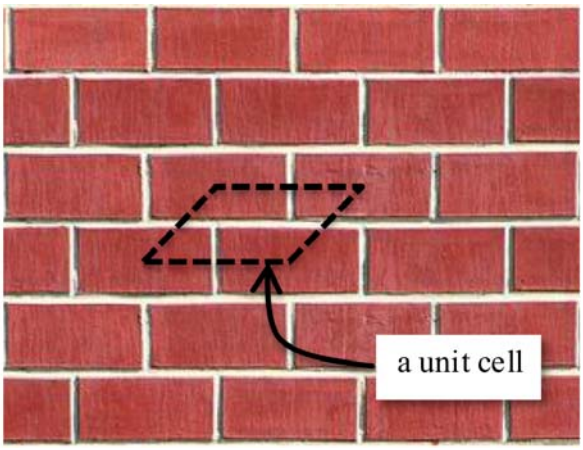
13. The molecules, atoms or ions that comprise the crystal interact with each other by forces of different kinds. Atoms are the smallest particles of matter that retain unique chemical properties and they can assemble through chemical processes to form molecules. Ions are atoms or molecules that have gained or lost electrons and thus bear an electrical charge. Organic molecules, molecules that are mostly formed by carbon atoms, form crystals, known as molecular crystals, in which the molecules are held together by weak but attractive and approximately directional to non-directional intermolecular forces such as hydrogen bonds and van der Waals forces. (See, e.g., Eric J. Lien, Molecular Structure, Properties, and States of Matter, in Remington's Pharmaceutical Sciences 158, 169-170 (18th ed., 1990) ("Lien"); Linus Pauling, The Nature of the Chemical Bond 449- 504 (3d ed., 1960) ("Pauling").) Because the crystals in this case involve the molecule dofetilide, my discussion in this declaration will be mainly directed to molecular crystals.

14. A hydrogen bond is not a true chemical bond, but is a special kind of attractive force between a hydrogen atom bonded to either an oxygen, nitrogen or fluorine atom and

another oxygen, nitrogen or fluorine atom, e.g., O-H···O, O-H···N, etc. (dotted line indicates a hydrogen bond and solid line a chemical bond). It may occur either internal or external to a given molecule but, in the latter case, is recognized as an intermolecular force. (See, e.g., R. Chang, Chemistry 448-451 (McGraw Hill, 4th Ed., 1991).) Hydrogen bonding is the reason why ice floats on water – hydrogen bonding between water molecules in ice creates a crystal with large voids, making it less dense than water. It also explains why water boils at an anomalously high temperature for such a small molecule – the interaction between the intermolecular hydrogen bonds in water require more energy to break and free the water molecules than if they were not present.

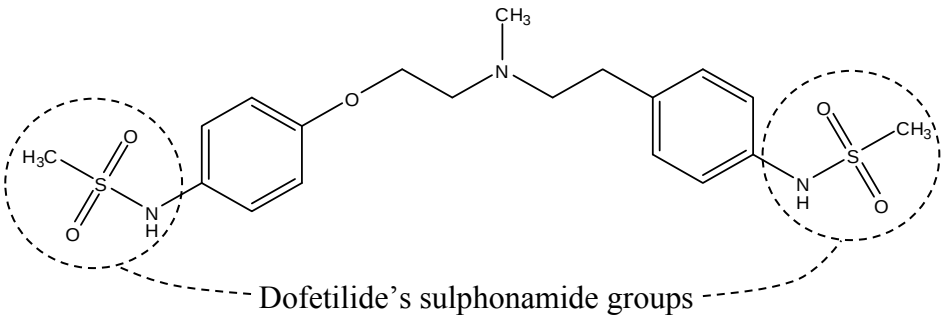
15. Van der Waals forces are attractive intermolecular forces arising from interactions of permanent or temporary electrical charges on different parts of molecules (e.g. static and/or instantaneous dipole moments). Van der Waals forces are both weaker and less directional than hydrogen bonds. (See, e.g., Lien at 169-170; Pauling at 449-504.)

16. "Crystal structure" or "crystal packing" refers to the identity, number, and position of the atoms, either individually or when bonded to form a molecule, relative to each other, extending periodically in three dimensions. The simplest collection of atoms that forms the crystal structure is the unit cell – the "building block" of the repeating pattern. Unit cells can be thought of as a collection of bricks in a building, second only to the brick itself (representing a molecule), unit cells are the smallest repeating pattern of molecules (bricks) and/or part of molecules (bricks) used to create the overall three-dimensional structure. Shown below is a two-dimensional crystal structure made up of bricks with the unit cell outlined by the dashed parallelogram.



17. Pharmaceutical compounds are often organic molecules that have groups of atoms at their peripheries that participate in hydrogen bonding. Thus, the very nature of organic compounds, and therefore pharmaceuticals, makes them well-suited to self-assembly of the type that promotes crystallization.

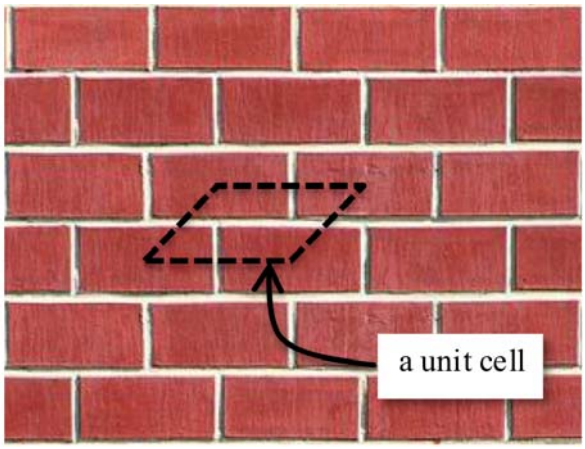
18. Dofetilide, in particular, has sulfonamide groups on each end which lends itself to forming hydrogen bonds with neighboring dofetilide molecules. (See, Laszlo Borka, Crystal Polymorphism of Pharmaceuticals, 40 Acta Pharm. Jugosl. 71-91 (1990) ("Borka") (disclosing several sulfonamides that form polymorphs); Terence L. Threlfall, Analysis of Organic Polymorphs A Review, 120 Analyst 2435-2460 (1995) ("Threlfall") (same).)



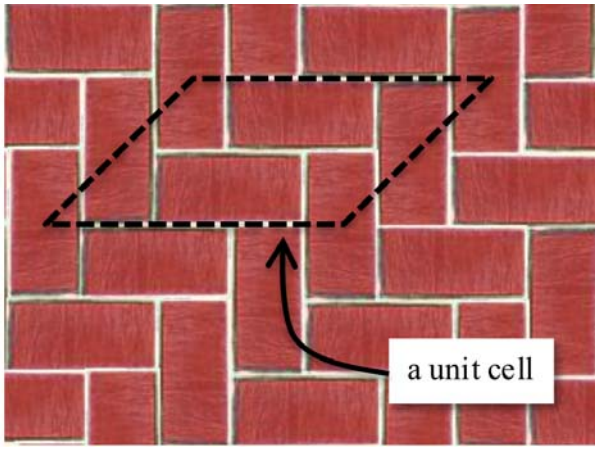
B. Polymorphs

19. The molecules in a crystal can often arrange themselves in more than one three-dimensional repeating pattern. In such circumstances, each unique arrangement is called a "polymorph."

20. Polymorphism can be understood by considering the following example of bricks arranged in two different two-dimensional patterns. In this example, the brick is analogous to a molecule, where the bricks are both identical to one another and are arranged in two different patterns, defining these two different polymorphs of bricks.



polymorph 1



polymorph 2

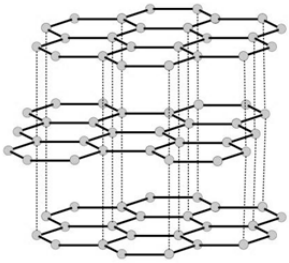
21. Different polymorphs of the same pure material, having different crystal packing may exhibit different physical properties.

22. A common example of polymorphism is carbon, which may take the form of two different crystalline polymorphs: graphite and diamond. Each is a form of carbon, but each has different physical properties.

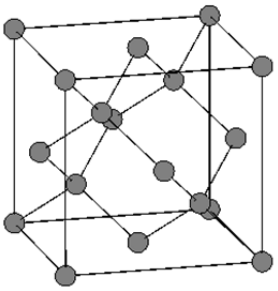
Graphite

Diamond

23. The different physical properties of the different polymorphic forms of carbon are directly attributable to their different crystal structures.



Graphite



Diamond

24. With respect to a molecule like dofetilide, the molecule may form a number of different polymorphs. (Ex. 1, '363 patent at col. 1, ll. 7-8.) This is attributable to the molecule's ability to assume different configurations, orient itself in different repeating patterns, and then lock in those different configurations and repeating patterns in the solid state through hydrogen bonds and other intermolecular forces.

25. A polymorph can be characterized using a number of analytical techniques, including powder X-ray diffraction ("PXRD" which is used interchangeably with X-ray powder diffraction or "XRPD"), differential scanning calorimetry ("DSC") and infrared ("IR") spectroscopy. The results of these analytical tests are analogous to taking a fingerprint of a

person. As fingerprints are unique to a person, the results of these analytical tests are unique to a particular polymorph of a pharmaceutical compound.

C. Differential Scanning Calorimetry ("DSC")

26. DSC is a well-known technique that uses heat to measure the physical properties of a material, such as its melting temperature. In a DSC experiment, a test sample and a reference are placed on two separate trays in a calorimeter and heat flow to or from each of the samples is measured as the temperature of the samples is increased.

27. The results of DSC are generally reflected in a graph (called a "thermogram") that contains one or more bands that reflect the amount of heat that is absorbed (an "endotherm" or "endothermic thermal event") or released (an "exotherm") by the sample in connection with a physical or chemical change in the sample. Energy is required to melt a solid as commonly shown by heat being required to melt ice to water, which is why the melting of a solid appears as an endothermic thermal event on the thermogram.

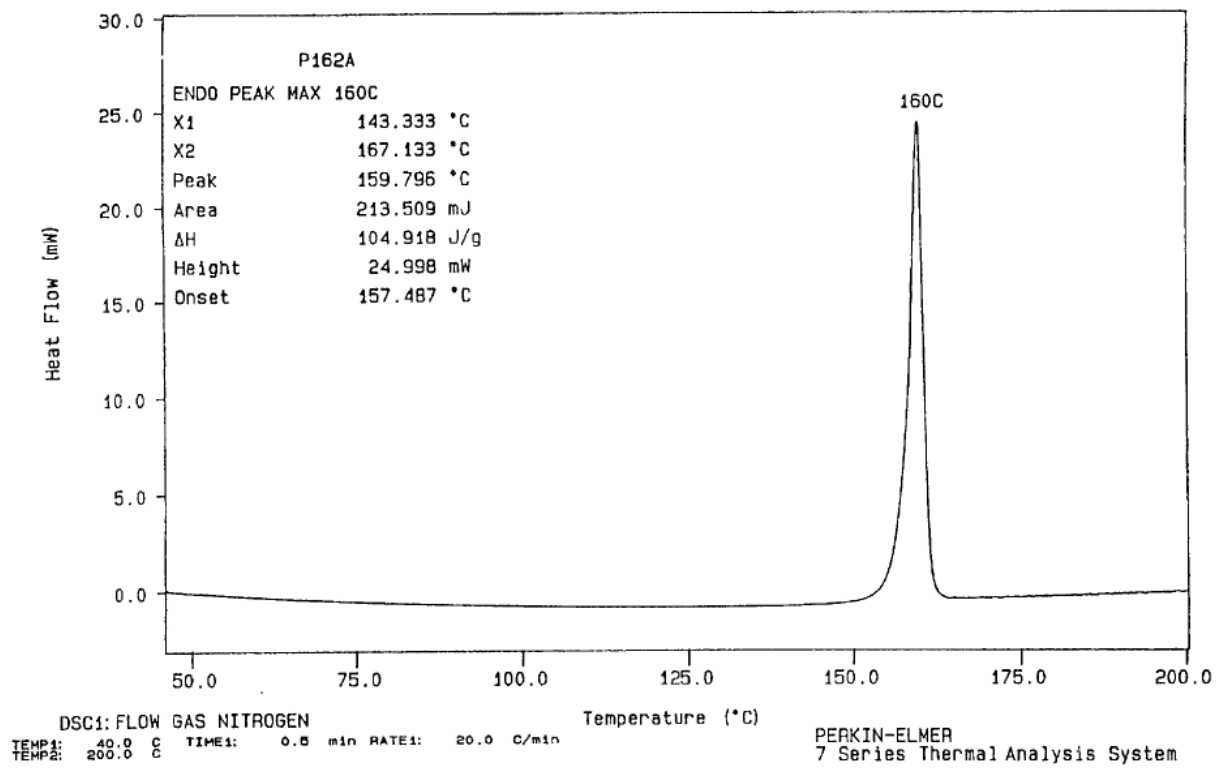
28. An endothermic thermal event is identified by a rise (onset) of a portion of the thermogram to a maximum value (peak) and then decline to a lower value. The endothermic thermal events that are present in the thermograms of the '363 patents are labeled by the temperature found at their peak value. The temperature of a peak is defined as the temperature corresponding to the maximum of the thermal event, as opposed to the onset of the event.

29. Any single crystal that melts will have a peak in its thermogram that occurs at the melting temperature. Mixtures of polymorphs may have several peaks that correspond to the temperatures at which the various materials in the mixture melt.

30. Below is a reproduction of a DSC thermogram disclosed in the '363 patent with respect to dofetilide polymorph P162a. (Id. at Figure 9.) This thermogram has a single peak that represents the melting temperature of P162a (at 159.796º C according to the legend).

Figure 9

DSC thermogram for dofetilide polymorph P162a



31. According to the United States Pharmacopeia ("USP"), an authoritative source for the pharmaceutical industry, the temperature at which the DSC peak occurs can be determined "objectively and reproducibly, often to within a few tenths of a degree." (Ex. 4, United States Pharmacopeia and National Formulary (USP 23-NF 23), 1837-1838 (1995) ("USP 23").) In particular, "[m]elting point determinations by scanning calorimetry have a reproducibility with a standard deviation of about 0.2°." (Id. at 1838.)

IV. U.S. PATENT NO. 6,124,363

32. The '363 patent acknowledges much of what was already known about dofetilide in the prior art, including: (a) methods of preparing dofetilide; (b) crystalline forms of dofetilide, (c) pure P136 dofetilide polymorph, (d) pure P162b dofetilide polymorph, (e) mixtures of dofetilide polymorphs; and (f) the use of dofetilide as an antiarrhythmic agent. (Ex. 1,

'363 patent at col. 1, ll. 50-59 (citing to EP-A-0245997); id. at col. 1, ll. 23-26 (same); id. at col. 1, ll. 40-43 (incorporating by reference European Patent Application No. 98306188.8); id. at col. 4, ll. 3-20 (citing prior art); id. at col. 4, ll. 21-23 (citing European Patent Application No. 98306188.8); id. at col. 4, ll. 58-62 (same).)

33. The '363 patent identifies at least five different dofetilide polymorphs, which are referred to as P136, P143, P162, P162a and P162b. (Id. at col. 1, ll. 50-59; id. at col. 7, l. 16-col. 8, l. 57 (Reference Examples 1, 1A, 2, 2A, 3 and 3A).) Because the prior art discloses mixtures of dofetilide as well as pure dofetilide polymorphs P136 and P162b, the three independent claims in the '363 patent are narrowly directed to "substantially pure" dofetilide polymorphs P162, P162a or P143.

34. The '363 patent is directed to specific polymorphs of the drug dofetilide. The '363 patent explains that dofetilide is a drug substance that was already known in the prior art to be an effective drug to treat certain heart conditions. (Id. at col. 1, ll. 23-41.) The specification further explains that prior art methods for preparing dofetilide produced mixtures of dofetilide polymorphs, or essentially pure dofetilide polymorphs P136 or P162b. (Id. at col. 1, ll. 50-57.) These prior art methods were not "directly suitable" for making dofetilide that can be used in a commercial product, however, because the resultant dofetilide would contain agglomerates that would have to be broken up by milling or micronization. (Id. at col. 1, ll. 50-59.)

35. The language used in each of the three independent claims is almost identical, except with respect to the specific dofetilide polymorph and the temperature at which the DSC peak occurs. Independent claims 1, 11 and 17 are reproduced below, with the identical language between the claims bolded:

Claim 1. **Substantially pure, crystalline, dofetilide polymorph** P162 **which is characterised by** differential scanning calorimetry (**DSC**) **in which it exhibits an endothermic thermal event at about** 162° C.

Claim 11. **Substantially pure, crystalline, dofetilide polymorph** P162a **which is characterised by DSC in which it exhibits an endothermic thermal event at about** 160° C.

Claim 17. **Substantially pure, crystalline, dofetilide polymorph** P143 **which is characterised by DSC in which it exhibits an endothermic thermal event at about** 144° C.

(Id. at col. 21, ll. 6-8; id. at col. 20, ll. 29-32, id. at col. 21, ll. 36-38.) The remaining claims all depend from and therefore incorporate the limitations of one of the three independent claims.

36. The '363 patent explains the significance of the DSC melting temperatures recited in the claims, stating that:

> Dofetilide polymorphs+ P162a and P162b have similar PXRD patterns and IR spectra, but different DSC characteristics, to dofetilide polymorph P162. The differences in the melting points of these polymorphs are due to varying degrees of disorder within the crystal structures of the polymorphs.

(Id. at col. 2, ll. 56-61.) The patent, therefore, describes to a person of ordinary skill that the differences in the DSC peaks are necessary to distinguishing the claimed dofetilide polymorphs P162 and P162a from each other and from the prior art dofetilide polymorph P162b.

37. The '363 patent states that "[t]he expression 'substantially pure' when used in conjunction with dofetilide polymorphs P162, P162a and P143 means at least 95% by weight pure." (Id. at col. 3, ll. 34-36.)

V. CONSTRUCTION OF THE TERMS OF THE '363 PATENT

38. I understand that claim construction involves understanding the meaning of the claims from the perspective of a person of ordinary skill in the art. I also understand that proper

claim construction begins with the claims themselves, and that words of a claim are generally given their plain and ordinary meaning to one of ordinary skill in the art.

39. I further understand that the claims do not stand alone, and must be considered in the context of the intrinsic evidence. Intrinsic evidence consists of the claims, specification and prosecution history of the patents. I understand that the specification is always deemed highly relevant to claim construction and is often the single best guide to understanding the meaning of a claim term. The prosecution history can also inform the meaning of the claim language by demonstrating how the patentee understood the scope of the claims and whether the inventor limited the scope of the claims during prosecution of the patent, making the claim scope narrower than it would otherwise be.

40. I also understand that extrinsic evidence, which includes all evidence outside of the patent and the prosecution history, can be useful in understanding the scope of the claims, but is generally considered less significant than the intrinsic evidence in determining the meaning of claim language. I have not used extrinsic evidence to develop my opinions if that extrinsic evidence contradicts an otherwise clear meaning of a claim term that can be ascertained from the intrinsic evidence.

A. Person of Ordinary Skill In The Art

41. I understand that there is one patent at issue in this litigation, the ‘363 patent.

42. For the issues addressed in my declaration, a person of ordinary skill in the art with respect to the patents-in-suit would have had, at the time of the claimed invention, at least a Masters degree in chemistry, chemical engineering, pharmaceutical sciences, or a related discipline. Alternatively, the person of ordinary skill in the art may have had a bachelor’s degree in one of those fields, with at least three years work experience in that field.

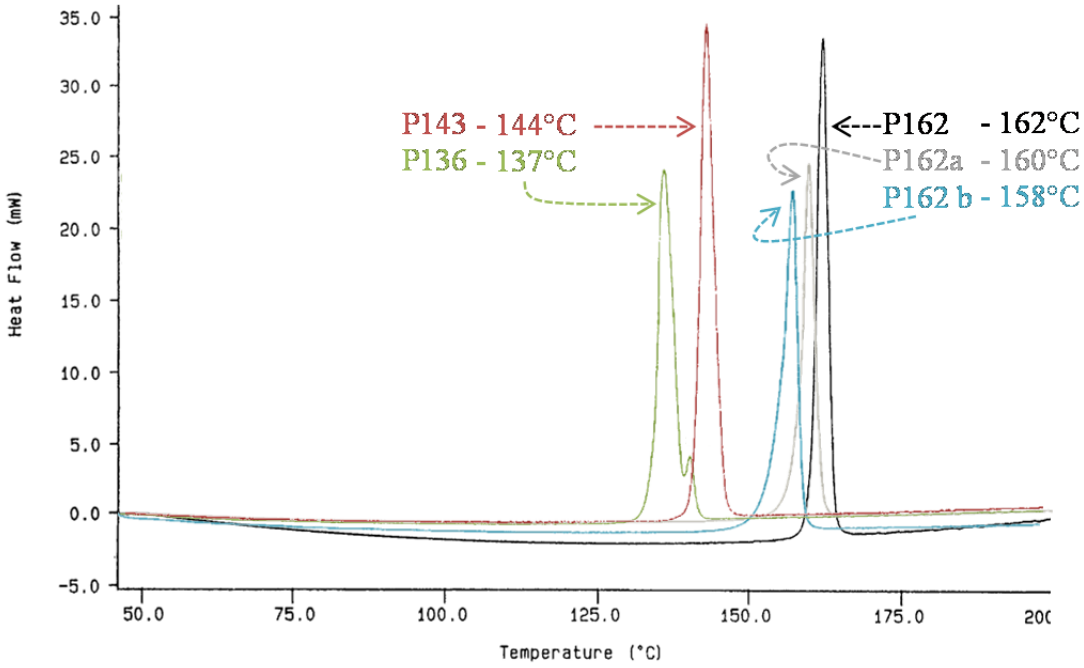
43. To the extent necessary, one of ordinary skill in the art would have collaborated with others of skill in the art, such that the individual and/or team collectively would have had experience in identifying compounds using data derived from analytical techniques (e.g., DSC, PXRD, and/or infrared spectroscopy) and/or experience in formulating oral dosage forms.

44. Although my experience exceeds that of a person of ordinary skill in the art, I understand that the claims and specification of the patents-in-suit are to be read in view of the understanding of one of ordinary skill in the art as of the filing date of each patent. Therefore, this declaration sets forth my opinions, reasoning and conclusions as to how a person of ordinary skill in the art would have understood the claim terms.

B. "Dofetilide Polymorph P[#] Which Is Characterized By DSC In Which It Exhibits An Endothermic Thermal Event At About [ ]° C"

45. It is my opinion that a person of ordinary skill in the art would understand the term "dofetilide polymorph P[#] which is characterized by DSC in which it exhibits an endothermic thermal event at about [ ]° C" in claims 1, 11 and 17 to mean that DSC must be used to distinguish the claimed form of dofetilide and that the term "about" would encompass a range of ± 0.3° C.

46. The thermograms for dofetilide polymorphs P162, P162a, P162b, P143 and P136 are shown below. (See, Id. at col. 6, ll. 63-67, col. 8, ll. 35-45, Figures 9, 10, 11, 14, 14B.) The DSC peak for dofetilide polymorph P162 occurs at a different temperature compared to temperatures for the two other claimed dofetilide polymorphs, P162a and P143. The DSC peaks for the three claimed dofetilide polymorphs (P162, P162a and P143) occur at different temperatures compared to the prior art dofetilide polymorphs P162b and P136.



47. Furthermore, Table 2 in the '363 patent specification summarizes the data from the DSC thermograms that are contained at Figures 8 through 14C of the '363 patent. (Id. at col. 14, ll. 18-52; id. at Figs. 8-14C; id. at Table 2.) The '363 patent purports to provide DSC results for four different samples of substantially pure dofetilide polymorph P162. According to these results, the peak of the endothermic event occurs at 162.5° C (P162), 162.0° C (Example 6), 162.8° C (Example 7) or 164.1° C (Example 8). (Id. at Table 2, col. 14-15.) These results are clearly distinguishable from the DSC results for other dofetilide polymorphs such as dofetilide polymorph P162a (reported peak endothermic event at 159.8° C), dofetilide polymorph P162b (reported peak endothermic event at 158.2° C) and dofetilide polymorph P143 (reported peak endothermic event at 144.3° C). (Id. at Table 2, col. 14-15.)

48. The differences in these DSC results demonstrate to a person of ordinary skill in the art that the DSC results are intended to distinguish one polymorphic form of dofetilide from other polymorphic forms of dofetilide.

49. The '363 patent explains that, given the similarities between dofetilide polymorphs P162, P162a and P162b, the DSC characteristics of these three polymorphs are critical to differentiating between them. In particular, the '363 patent explains:

> Dofetilide polymorphs P162a and P162b have similar PXRD patterns and IR spectra, but different DSC characteristics, to dofetilide polymorph P162.

(Ex. 1, '363 patent at col. 2, ll. 56-59).) In this statement, the patent makes clear that DSC characteristics are the only basis to distinguish the claimed dofetilide polymorphs P162 and P162a from the prior art dofetilide polymorph P162b.

50. The claims include the term "about" preceding the claimed temperature of the endothermic thermal event. The word "about" permits some flexibility as to the range encompassed by the claimed limitations.

51. The USP monograph for DSC provides an objective starting point to understand the variability associated with DSC analyses, and is, therefore, also the starting point for one of skill in the art to understand the meaning of the "about" in claims 1, 11 and 17 given that the USP is authoritative for one of ordinary skill in the art in the pharmaceutical industry. (Ex. 4, USP 23 at 1837-1838.) The USP explains that DSC measurements can be made "often to within a few tenths of a degree," and that the measurements "have a reproducibility with a standard deviation of about 0.2° [C]." (Id. at 1837-1838 (1995).)

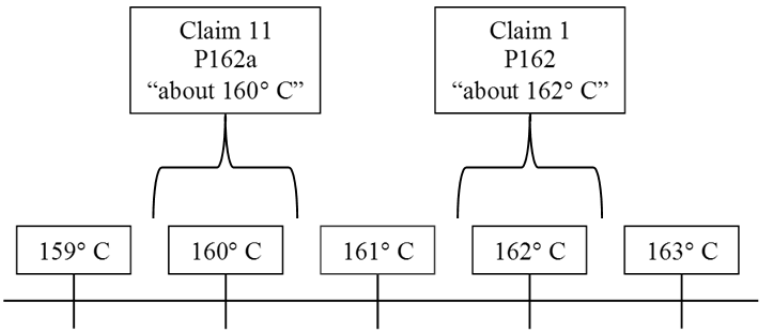
52. A range of ± 0.3º C around the claimed temperatures defining the term "about" is consistent with both the measurement error of "a few tenths of a degree" and the reproducibility of the measurement of "about 0.2" in the USP monograph.

53. This range of ± 0.3º C around the claimed temperatures is also consistent with the '363 patent specification. Dofetilide polymorph 162a had a DSC peak at 159.8º C, which is

within 0.3º C of the claimed DSC peak at "160º C" in claim 11. (Compare Ex. 1, '363 patent at col. 14 (reporting in Table 2 that P162a has "Peak = 159.8º C") with id. at col. 21, ll. 6-8 ("160º C" recited in claim 11).) Similarly, dofetilide polymorph P143 had a DSC peak at 144.3º C,[1] which is also within 0.3º C of the claimed DSC peak at "144º C" in claim 17. (Compare DA Ex. 1, '363 patent at col. 15 (reporting in Table 2 that P143 has "Peak = 144.3º C") with id. at col. 21, ll. 36-38 ("144º C" recited in claim 17).) Thus, applying the ± 0.3º C range to the term "about" with respect to P162a and P143 is in accordance with the USP and the '363 patent specification.

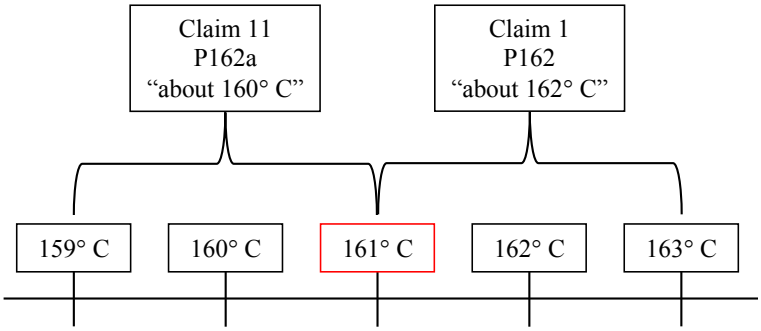
54. Given the criticality of the endothermic thermal events to distinguish between P162, P162a and P162b, a person of ordinary skill would understand the range associated with the term "about" cannot be so broad as to define more than one of P162, P162a or P162b. Notably, claim 1 of the '363 patent requires that the endothermic thermal event occurs at "about 162º C," and claim 11 requires that the endothermic thermal event occurs at "about 160º C."

55. A range of ± 0.3º C around the claimed temperatures defining the term "about" allows for a clear distinction between the claimed dofetilide polymorphs based on their DSC characteristics as illustrated in the following figure with respect to independent claims 1 and 11:

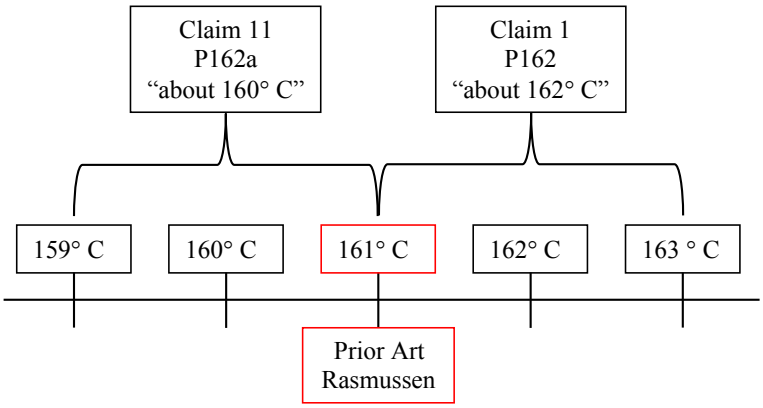


[1] Although Figure 11 lists the DSC peak for dofetilide polymorph P143 at 144.342º C, one of ordinary skill in the art would not deem all of these digits to be significant. Instead, the rounded DSC peak temperature in Table 2 (i.e., 144.3º C) indicates to one of ordinary skill in the art that only the first decimal place in the measured temperature is significant and therefore relevant to understanding the meaning of "about" in connection with the claimed DSC temperatures..

56. With respect to at least independent claims 1 and 11, the amount of variability permitted by "about" cannot be as large as even 1º C, otherwise one would not be able to distinguish between P162 and P162a by DSC as illustrated below:



57. Furthermore, applying a range of ± 1º C range to the term "about" would cause claims 1 and 11 to encompass the prior art. For example, a publically available journal article discloses a crystalline dofetilide polymorph with a "melting point of 161° C." (Ex. 5, H. S. Rasmussen, Dofetilide, A Novel Class III Antiarrhythmic Agent, 20 J. Cardiovascular Pharmacology S97 (Suppl. 2 1992) ("Rasmussen"). As illustrated below , subtracting 1º C from 162º C as recited in claim 1 or adding 1º C to "160º C" as recited in claim 11 would cause the "endothermic thermal event" to read directly onto the melting point of the Rasmussen dofetilide polymorph's melting point of 161º C:



58. Thus a person of ordinary skill would understand the term "about" in claims 11 and 17 to encompass a range of ± 0.3° C as being consistent with the USP, the claims and specification of the '363 patent, while not allowing the claims to read on the prior art.

59. With respect to dofetilide polymorph P162 (claim 1), a person of ordinary skill might have increased the upper range in interpreting the term "about" to 164.1° C because the DSC results in Table 2 demonstrate that dofetilide polymorph P162 exhibits endothermic events as low as 162.0 º C (Example 6) and as high as 164.1º C (Example 8). (Ex. 1, '363 patent at col. 14-15 Table 2.) Regardless of whether a person of ordinary skill would have understood the upper range with respect to dofetilide polymorph P162 to be as high as 164.1º C, a person of ordinary skill would not have understood the lower range to be any lower than 161.7º C (162.0º C - 0.3º C) for the reasons described above.

C. "Substantially Pure"

60. It is my opinion that a person of ordinary skill in the art would understand the term "substantially pure" to mean "at least 95% by weight pure."

61. The specification of the '363 patent states that "[t]he expression 'substantially pure' when used in conjunction with dofetilide polymorphs P162, P162a and P143 means at least 95% by weight pure." (Ex. 1, '363 patent, col. 3, ll. 34-36.) A person of ordinary skill in the art would look to the express definition of "substantially pure" provided by the specification of the '363 patent to construe the term "substantially pure" as "greater than 95% by weight pure."

62. Thus, a person of ordinary skill in the art would look to the definition of "substantially pure" provided by the specification of the '363 patent to construe the term "substantially pure" as "greater than 95% by weight pure."

D. "Endothermic Thermal Event"

63. It is my opinion that a person of ordinary skill in the art would understand the temperature describing the location of an "endothermic thermal event" would mean the temperature at which the endothermic thermal event has its maximum value.

64. Claim 1 states that the endothermic thermal event for dofetilide polymorph P162 occurs "at about 162º C" for P162. (Id. At col. 20, ll. 29-32.) This is consistent with the temperature at which the "peak" of the endothermic thermal event occurs as reported in Table 2. (E.g., Id. At col. 14 (Sample P162 has an endothermic thermal event at "Peak = 162.5º C").) Similarly, claim 11 states that the endothermic thermal event for dofetilide polymorph P162a occurs at "about 160º C," which is consistent with the data reported in Table 2. (Id. At col. 14 (Sample P162a has an endothermic thermal event at "Peak = 159.8º C").). Likewise, claim 17 states that the endothermic thermal event for dofetilide polymorph P143 occurs at "about 144ºC," which is also consistent with the data reported in Table 2. (Id. At col. 15 (Sample P143 has an endothermic thermal event at "Peak = 144.3º C").) The temperature at which the "peak" occurs also corresponds to the maximum value of the endotherm on the corresponding thermograms. (Id., compare Table 2 with Figures 8, 9 and 11.)

VI. INFORMATION CONSIDERED, PRIOR TESTIMONY AND COMPENSATION

65. The bases for the opinions expressed in this declaration include my knowledge, education, training and experience. I have also considered in part or in full all of the documents listed in Exhibit 2 including those documents cited in this declaration. My bases also include conversations with counsel regarding the legal standards, summarized above, that are applicable for claim construction.

66. I have testified as an expert by deposition within the last five years in Pfizer Inc. et al v. Zydus Pharmaceuticals USA Inc. et al., Civil Action No. 12-808-SLR (D. Del. 2014). I

testified on behalf of Lupin, Inc. in that matter. I have testified as an expert at trial within the last five years in Bristol-Myers Squibb Co. et al. v. Mylan Pharmaceuticals Inc. et al., Civil Action No. 09-651-LPS (D. Del. 2013). I testified on behalf of Mylan Pharmaceuticals, Inc. in that matter.

67. I am being compensated for my work in this matter at my regular consulting rate of between $500 and $650 per hour, depending on the nature of the work. My compensation is not dependent in any way on the outcome of this case.

68. I may be asked to provide background information in these proceedings that will assist the Court to understand the science and technology relevant to the patents-in-suit. At hearings and/or trial, I may rely on materials and documents publicly available or produced in this litigation by Plaintiffs, Defendants, and/or third parties. I may also rely on visual aids and demonstrative exhibits that I may prepare if requested to do so or in response to new information. I reserve the right to supplement or amend the foregoing as appropriate, if I become aware of any additional pertinent information, or in response to the testimony, declaration, reports or analyses of other witnesses, including expert witnesses who testify on behalf of Plaintiffs or other defendants.

* * *

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 4, 2014.

Craig Eckhardt, Ph.D.